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1 Routine/Function Prologues

1.0.1 noah_alb.F90: (Source File: noah_alb.F90)

This subroutine takes quarterly surface albedo (snow-free) data and day to interpolate and determine the actual value of the albedo for that date. This actual value is then returned to the main program. The assumption is that the data point is valid for the dates of January 31, April 30, July 31, and October 31.

REVISION HISTORY:

28 Apr 2002: K. Arsenault; Added NOAH LSM to LDAS, initial code

INTERFACE:

```
subroutine noah_alb
```

USES:

```
use time_module
use noah_varder      ! NOAH tile variables
use time_manager
use lisdrv_module, only : grid,tile,lis
#if ( defined OPENDAP )
use opendap_module
#endif
implicit none
```

CONTENTS:

```
zeroi=0
noahdrv%noah_aflag = 0
!-----
! Determine Dates of the quarters in terms of Year (e.g., 1999.3)
!-----
time=lis%t%time
yr=lis%t%yr
!-----
! January 31
!-----
janda=31
janmo=01
call date2time(jan31,doy1,gmt1,yr,janmo,&
              janda,zeroi,zeroi,zeroi)
!-----
! April 30
!-----
aprda=30
aprmo=04
call date2time(apr30,doy1,gmt1,yr,aprmo,&
              aprda,zeroi,zeroi,zeroi)
```

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!-----
!  July 31
!-----
      julda=31
      julmo=07
      call date2time(jul31,doy1,gmt1,yr,julmo,&
                    julda,zeroi,zeroi,zeroi)
!-----
!  October 31
!-----
      octda=31
      octmo=10
      call date2time(oct31,doy1,gmt1,yr,octmo,&
                    octda,zeroi,zeroi,zeroi)
!-----
! Determine which two quarterly albedo files book-end model time.
!-----

      if ( time.ge.jan31 .and. time.le.apr30 ) then
          qq1="01"
          qq2="02"
          qdif = apr30-jan31
          timdif = time-jan31
          albflag = 1
      elseif ( time.ge.apr30 .and. time.le.jul31 ) then
          qq1="02"
          qq2="03"
          qdif = jul31-apr30
          timdif = time-apr30
          albflag = 2
      elseif ( time.ge.jul31 .and. time.le.oct31 ) then
          qq1="03"
          qq2="04"
          qdif = oct31-jul31
          timdif = time-jul31
          albflag = 3
      elseif ( time.ge.oct31 ) then
          qq1="04"
          qq2="01"
          qdif = (jan31+1.0)-oct31
          timdif = time-oct31
          albflag = 4
      elseif ( time.lt.jan31) then
          qq1="04"
          qq2="01"
          oct31=oct31-1.0
          qdif = jan31-oct31
          timdif = time-oct31

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    albflag = 5
endif

if(noahdrv%noah_albtime .ne. albflag) then
    noahdrv%noah_albtime = albflag
    noahdrv%noah_aflag = 1
!-----
!  Open the needed two quarterly snow-free albedo files
!-----

#if ( defined OPENDAP )
    print*, 'MSG: noah_alb -- Retrieving ALBEDO file ',&
        trim(noahdrv%noah_albfile)//'albedo_'//QQ1//'.bfsa',&
        ' (' ,iam,')'
    call system("opendap_scripts/getalbedo.pl "//ciam//" "// &
        trim(noahdrv%noah_albfile)//'albedo_'//QQ1//'.bfsa' &
        //" "//cparm_slat//" "//cparm_nlat                &
        //" "//cparm_wlon//" "//cparm_elon//" "//QQ1)
    print*, 'MSG: noah_alb -- Retrieving ALBEDO file ', &
        trim(noahdrv%noah_albfile)//'albedo_'//QQ2//'.bfsa',&
        ' (' ,iam,')'
    call system("opendap_scripts/getalbedo.pl "//ciam//" "// &
        trim(noahdrv%noah_albfile)//'albedo_'//QQ2//'.bfsa' &
        //" "//cparm_slat//" "//cparm_nlat                &
        //" "//cparm_wlon//" "//cparm_elon//" "//QQ2)
#endif

    print*, 'MSG: noah_alb -- Retrieving ALBEDO file ',&
        trim(noahdrv%noah_albfile)//'albedo_'//QQ1//'.bfsa',&
        ' (' ,iam,')'
    OPEN (10, &
        FILE=trim(NOAHDRV%NOAH_ALBFILE)//'albedo_'//QQ1//'.bfsa',&
        STATUS='OLD',FORM='UNFORMATTED')
    print*, 'MSG: noah_alb -- Retrieving ALBEDO file ', &
        trim(noahdrv%noah_albfile)//'albedo_'//QQ2//'.bfsa',&
        ' (' ,iam,')'
    OPEN (11, &
        FILE=trim(NOAHDRV%NOAH_ALBFILE)//'albedo_'//QQ2//'.bfsa',&
        STATUS='OLD',FORM='UNFORMATTED')

    read(10) value1
    read(11) value2
    close(10)
    close(11)
!-----
! Assign quarterly albedo fractions to each tile.
!-----

    do i=1,lis%d%nch
        if((value1(tile(i)%col, tile(i)%row-tnroffset).ne.-9999.000) &

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        .and. (value2(tile(i)%col,tile(i)%row-tnroffset)&
        .ne.-9999.000)) then
        noah(i)%albsf1= value1(tile(i)%col, tile(i)%row-tnroffset)
        noah(i)%albsf2= value2(tile(i)%col, tile(i)%row-tnroffset)
    endif
enddo
endif      ! End albflag selection
!-----
! Assign albedo fractions to each tile and interpolate daily.
!-----
if (noahdrv%noah_albdchk .ne. lis%t%da) then
    noahdrv%noah_aflag = 1
    do i=1,lis%d%nch
        if (noah(i)%albsf1 .ne. -9999.000) then
            valdif(i) = noah(i)%albsf2 - noah(i)%albsf1
            noah(i)%albsf = (timdif*valdif(i)/qdif)+noah(i)%albsf1
        endif
    end do
    noahdrv%noah_albdchk=lis%t%da

    if(lis%o%wparam.eq.1) then
        allocate(albout(lis%d%lnc,lis%d%lnr))
        do i=1,lis%d%nch
            if(grid(i)%lat*1000.ge.lis%d%kgds(4).and. &
                grid(i)%lat*1000.le.lis%d%kgds(7).and. &
                grid(i)%lon*1000.ge.lis%d%kgds(5).and. &
                grid(i)%lon*1000.le.lis%d%kgds(8)) then
                rindex = tile(i)%row - (lis%d%kgds(4)-lis%d%kgds(44)) &
                    /lis%d%kgds(9)
                cindex = tile(i)%col - (lis%d%kgds(5)-lis%d%kgds(45)) &
                    /lis%d%kgds(10)
                albout(cindex,rindex) = noah(i)%albsf
            endif
        enddo
        open(32,file="albout.bin",form='unformatted')
        write(32) albout
        close(32)
        deallocate(albout)
    end if
endif ! End daily interpolation
return

```